



DL371 Audio System Engine Operator Manual

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DL371 Audio System Engine — Operator Manual
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In line with the company's policy of continual improvement, specifications and function may be subject to change without notice. This Operator Manual was correct at the time of writing. E&OE.



IMPORTANT SAFETY INSTRUCTIONS



The lightning flash with arrowhead symbol within an equilateral triangle is intended to alert the user to the presence of uninsulated “dangerous voltage” within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.

- 1 Read these instructions.
- 2 Keep these instructions.
- 3 Heed all warnings.
- 4 Follow all instructions.
- 5 Do not use this apparatus near water.
- 6 Clean only with a dry cloth.
- 7 Do not block any of the ventilation openings. Install in accordance with the manufacturer's instructions.
- 8 Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
- 9 Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
- 10 Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles and the point where they exit from the apparatus.
- 11 Only use attachments/accessories specified by the manufacturer.
- 12 Unplug this apparatus during lightning storms or when unused for long periods of time.
- 13 Refer all servicing to qualified personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
- 14 Use the mains plug to disconnect the apparatus from the mains.
- 15 **Warning: To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture.**
- 16 **Warning: Do not expose this equipment to dripping or splashing and ensure that no objects filled with liquids, such as vases, are placed on the equipment.**
- 17 **Warning: The mains plug of the power supply cord shall remain readily operable.**



EC-Declaration of Conformity

The undersigned, representing the following manufacturer

Manufacturer:

Midas Klark Teknik Ltd.

Address:

Klark Industrial Park, Walter Nash Road,
Kidderminster. Worcestershire. DY11 7HJ.

hereby declares that the following product

Product Type Number	Product Description	Nominal Voltage(s)	Current*	Freq.
DL371	Audio System Engine	115V AC 230V AC	2.50A 1.34A	50/60Hz

* With five modules fitted.

is in conformity with the regulations of the following marked EC-directives and bears the CE-mark accordingly

reference number	title
2004/108/EC	EMC Directive (EMC)
2006/95/EC	Low-Voltage Directive (LVD)

The conformity of the product with EC Directives for use in environment E4 is provided by compliance with the following standards:

Standards/date:

Applied Electrical Safety test standards:

reference number	title
EN 60065:2002	Audio, video and similar electronic apparatus. Safety requirements

Applied EMC emission test standards:

ref. no.	title
EN 55103-1:1996 Class A	EN 55103-1 Annex A: Radiated magnetic disturbance, 50Hz-50kHz CISPR 22: Radiated disturbance, 30-1000MHz EN 55103-1 Annex E: Conducted disturbance, ac & signal ports EN 61000-3-2:2000 Mains harmonics EN 61000-3-3:1995 Mains voltage flicker

Applied EMC immunity test standards:

ref. no.	title
EN 55103-2:1996 Class A	EN 61000-4-2:1995 Electrostatic discharge EN 61000-4-3:1996: Radiated RF disturbance, 80-1000MHz EN 55103-2 Annex A: Magnetic LF disturbance, 50Hz-10kHz EN 61000-4-4:1995: Fast transient bursts, ac & signal ports EN 61000-4-5:1995: Surge, ac port EN 61000-4-6:1996: Conducted RF field, ac & signal ports EN 61000-4-11:1994: Mains voltage dips and interruptions



Place, date: Kidderminster, UK
14th June 2010

General Manager
Printed name: John Oakley



AVP, Product Development
Printed name: Alex Cooper

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Precautions

Before installing, setting up or operating this equipment make sure you have read and fully understand all of this section and the “IMPORTANT SAFETY INSTRUCTIONS” at the front of this manual.

This equipment is supplied by a mains voltage that can cause electric shock injury!

The following must be observed in order to maintain safety and electromagnetic compatibility (EMC) performance.

Safety warnings

Signal 0V is connected internally to the chassis.

To completely disconnect this equipment from the AC mains, while observing full safety precautions (see “Power” on page xiii), switch off the D.C. POWER ON switch (above the PSU modules on rear of unit) and then switch off the mains at the mains outlet. Isolate the unit by unplugging the three mains leads from rear panel.

To avoid electrical shock do not remove covers.

General precautions

In the event of ground loop problems, disconnect the signal screen at one end of the connecting cables. Note that this can only be done when the equipment is used within a balanced system.

Do not remove, hide or deface any warnings or cautions.

Power

The power supplies contain LETHAL VOLTAGES greatly in excess of the mains voltage and its rails can produce extremely large currents that could burn out equipment and wiring if shorted.

The internal power supplies are of the switch mode type that automatically sense the incoming mains voltage and will work where the nominal voltage is in the range 100VAC to 240VAC.

Each mains inlet is to be sourced from its own separate wall-mounted mains outlet socket. Otherwise, their mains sources must be suitably

distributed so as to meet local safety regulations.

A Volex locking type plug is fitted on each supplied mains cable, which plugs into a mains IEC connector on the unit. When fitted properly the Volex plug locks into place, preventing it from working loose, or being inadvertently knocked loose or pulled out. To fit a Volex plug, insert it into the mains IEC connector and push it in until it locks in place. Then, check to make sure it is locked in place. To remove it, release its locking device and then pull it out. When fitting or removing a Volex plug, always hold the plug itself and never use the cable, as this may damage it.

When removing the equipment's electric plugs from the outlets, always hold the plug itself and not the cable. Pulling out the plug by the cable can damage it.

Never insert or remove an electric plug with wet hands.

Do not connect/disconnect a mains power connector to/from the unit while power is being applied to it. Switch the power off first.

Handling the equipment

Completely isolate the equipment electrically and disconnect all cables from the equipment before moving it.

When lifting or moving the equipment, always take its size and weight into consideration. If necessary, use suitable lifting equipment or transporting gear, or sufficient additional personnel.

Do not insert your fingers or hands in any gaps or openings on the equipment, for example, vents.

Installation

Before installing the equipment:

- Make sure the equipment is correctly connected to the protective earth conductor of the mains voltage supply of the system installation through the mains leads.
- Power to the equipment must be via a fused spur(s).
- Power plugs must be inserted in socket outlets provided with protective earth contacts. The electrical supply at the socket outlets must provide appropriate over-current protection.
- Both the mains supply and the quality of earthing must be adequate for the equipment.
- Before connecting up the equipment, check that the mains power supply voltage rating corresponds with the local mains power supply. The rating of the mains power supply voltage is printed on the equipment.

Location

Ideally a cool area is preferred, away from power distribution equipment or other potential sources of interference.

Do not install the equipment in places of poor ventilation.

Do not install this equipment in a location subjected to excessive heat, dust or mechanical vibration. Allow for adequate ventilation around the equipment, making sure that its fans and vents are not obstructed. Whenever possible, keep the equipment out of direct sunlight.

Do not place the equipment in an unstable condition where it might accidentally fall over.

Make sure that the mains voltage and fuse rating information of the equipment will be visible after installation.

Audio connections

To ensure the correct and reliable operation of your equipment, only high quality, balanced, screened, twisted pair audio cable should be used.

XLR connector shells should be of metal construction so that they provide a screen when connected to the control centre and, where appropriate, they should have Pin 1 connected to the cable screen.

Electrostatic discharge (ESD) precautions



Observe full electrostatic discharge (ESD) — also known as “anti-static” — precautions when carrying out procedures in this manual that are accompanied by the ESD Susceptibility Symbol (shown above). This caution symbol shows you that ESD damage may be caused to items unless proper ESD precautions are taken, which include the following practices:

- Keep the work area free from plastic, vinyl or styrofoam.
- Wear an anti-static wrist strap.
- Discharge personal static before handling devices.
- Ground the work surface.
- Avoid touching ESD-sensitive devices.

Radio frequency interference—Class A device

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Electric fields

Caution:

In accordance with Part 15 of the FCC Rules & Regulations, “... changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.”

Should this product be used in an electromagnetic field that is amplitude modulated by an audio frequency signal (20Hz to 20kHz), the signal to noise ratio may be degraded. Degradation of up to 60dB at a frequency corresponding to the modulation

signal may be experienced under extreme conditions (3V/m, 90% modulation).

Safety equipment

Never remove, for example, covers, housings or any other safety guards. Do not operate the equipment or any of its parts if safety guards are ineffective or their effectiveness has been reduced.

Optional equipment

Unless advised otherwise, optional equipment must only be installed by service personnel and in accordance with the appropriate assembly and usage regulations.

Special accessories

To comply with part 15 of the FCC Rules, any special accessories (that is, items that cannot be readily obtained from multiple retail outlets) supplied with this equipment must be used with this equipment; do not use any alternatives as they may not fulfil the RF requirement.

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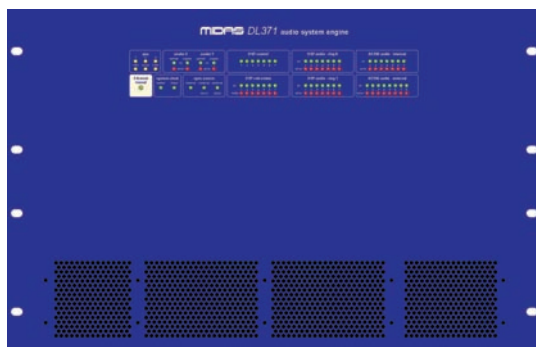
Chapter 1: Introduction

Thank you for purchasing a Midas DL371 Audio System Engine. Your DL371 Audio System Engine was conceived by Midas to offer audio professionals high-performance audio equipment, designed to provide no-compromise sonic quality with a feature set that offers all essential facilities and functions. It represents the very best of British design and engineering combined with contemporary, efficient manufacturing methods, and will give you many years of reliable service.

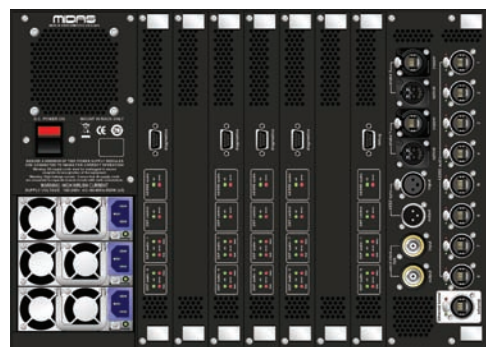
So, to obtain the best results with a minimum of effort, please read this operator manual and, finally, enjoy your Midas DL371 Audio System Engine!

Overview

The DL371 Audio System Engine (and router) is of user-configurable sub-modular construction and provides power and interconnection for up to seven DSP cards and a router card (dual width). The DL371 Audio System Engine is housed in a 7U, 19" rack mount box.



Front panel



Rear panel
(standard configuration)

Each DSP module contains enough digital signal processing power to produce 24 channels of audio EQ and dynamic processing (or to mix down all the console buses and similar etc.). Only five DSP modules are required for the PRO6. The rack can be optionally populated to incorporate an N+1 topology.

The router module is the heart of the console's signal routing network and provides ports for the main and supplementary I/O racks, and the long haul digital snake from stage to front of house.

Features

The DL371 Audio System Engine has the following features:

- The front panel consists of various LED-only sections that provide status information.
- Sub-modular construction provides user-configurable 7 x 24-channel format.
- Each module has remote interrogate LEDs for DSP control and analogue and digital audio for health and connection status feedback.
- A **diagnostics** 9-way D-type connector per DSP module provides access to its software for diagnosis, troubleshooting etc.
- Eight AES50 24-wide bi-directional digital audio EtherCon® ports are provided, four to allow N+1 connection of the main 64-way I/O rack and four to allow dual redundant connection of DL451 Modular I/O (24-way I/O) units or a second 64-way I/O rack¹.
- Dual redundant (gigabit) Hyper-MAC 192-wide bi-directional digital audio ports link the router to the control centre on either 150 m fibre or 100 m ruggedised Cat5E² cables, both of which use Neutrik connectors.
- For synchronisation to external systems there are two BNC Clock ports and two XLR digital audio reference signal (DARS) ports. Both sets of ports have one in and one out port.
- A 100Mbps Ethernet control port (on EtherCon®) allows a 'tunnel' connection to external non-Midas equipment via the control surface.
- The unit offers the facility of universal input, N+1 redundant power supplies with 3 latching mains connectors.
- The unit is force air cooled by means of 80 mm fans. These produce low noise, which is suitable for concert sound. However, racking in separate "amp rooms" is advised for theatre use.

Warranty and registration

Midas has total confidence in the quality and reliability of this product. To back this up, this product comes with the standard Midas and Klark Teknik three year warranty.

Please take the time to register your product by completing and returning the registration card or registering on our website at www.midasconsoles.com.

-
1. Neither the 64-way I/O rack or the DL451 Modular I/O are included in the standard (supply) specification of the PRO6.
 2. The Cat5E cables supplied are a proven tested solution, but Cat6 can also be used for installations etc.

About this manual

This is the operation manual for the DL371 Audio System Engine. It is intended to help get your DL371 Audio System Engine installed and in operation as quickly as possible by giving you unpacking, installation, connection, setting up and operating instructions. To help familiarise you with the DL371 Audio System Engine there is a description of the front and rear panels, along with easy-to-follow user instructions.

This manual is aimed at professionals, such as front of house (FOH) and monitor (MON) engineers who will be using this equipment in a live performance environment. It is assumed that the reader has prior experience of using professional audio equipment and has, most likely, undergone training on this system.

Details in this manual, such as configuration, setting up, connecting up etc., refer only to the unit connected in a standard PRO6 Live Performance System. Should you wish to connect this unit in any other configuration, contact Midas Technical Support for details.

The appendices include a brief overview of the PRO6 Live Performance System. However, if you want to learn more about the PRO6 Live Performance System, please go on to read its owner's manual (part number DOC02-DL3), which provides a full and comprehensive guide.

Unpacking

Carefully unpack your DL371 Audio System Engine equipment package.

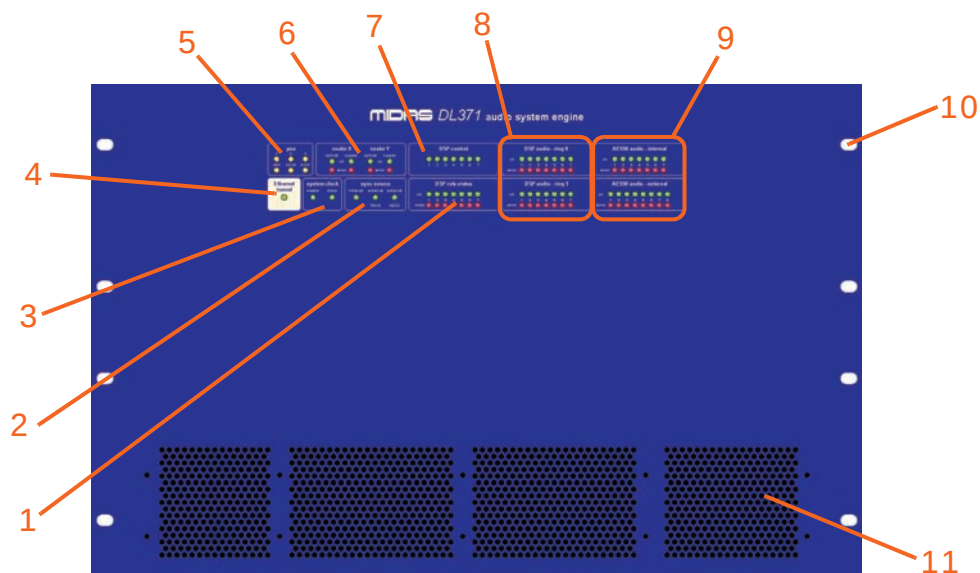
Inspect the DL371 Audio System Engine unit carefully for any signs of damage that may have occurred during transit and notify the courier immediately if any is discovered.

Check the contents of your DL371 Audio System Engine equipment package and, if there are any parts missing, incorrect or faulty, please contact your local distributor or Midas at the address shown in the front of this manual.

Please retain the original packing in case you should need to return the equipment to the manufacturer or supplier, or transport or ship the unit later.

Chapter 2: Front Panel

The front panel of the DL351 Modular I/O comprises the following:



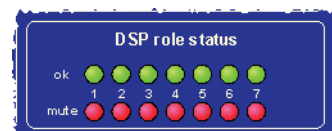
- 1 DSP role status** panel; see “DSP role status panel” on page 5.
- 2 sync source** panel; see “sync source panel” on page 6.
- 3 system clock** panel; see “system clock panel” on page 6.
- 4 Ethernet tunnel** panel; see “Ethernet tunnel panel” on page 6.
- 5 psu source** panel; see “psu panel” on page 6.
- 6 snake X and Y** panel; see “Snake X and Y panel” on page 7.

- 7 DSP control** panel; see “DSP control panel” on page 7.
- 8 DSP audio** panel; see “DSP audio panels” on page 7.
- 9 AES50 audio** panel; see “AES50 audio panels” on page 7.
- 10** Cut-outs for rack mounting fixings.
- 11** Four ventilation panels. **Do not obstruct.**

DSP role status panel

The **DSP role status** panel has seven sets of LEDs, one per module, for monitoring their module’s communication status. Each set comprises a green **ok** LED and a red **mute** LED, which indicate the following:

- **ok** LED constantly on = module is receiving control updates from the control centre.
- **mute** LED constantly on = role is muted/error condition. On the PRO6 Control Centre, check the Diagnostics screen (GUI menu) for further status information. (The **mute** LEDs will illuminate briefly as the role starts.)



sync source panel

This has three LEDs, one of which illuminates to indicate the source of the clock as follows:

- **internal** - clock is sourced internally to the router.
- **external (Word)** — clock is sourced from the word clock connector on the rear panel of the router at 96kHz; see “Connector panel” on page 12.
- **external (AES3)** — clock is sourced from the AES3 connectors on the rear panel of the router at 96kHz; see “Connector panel” on page 12.



system clock panel

This panel has a **master** and a **slave** LED, one of which will illuminate to indicate whether the router is audio synchronisation master or slave.



Ethernet tunnel panel

The Ethernet control panel has a green LED, which has three states of illumination to indicate the following:

- **Off** = not connected.
- **On** = connected.
- **Flashing** = active.

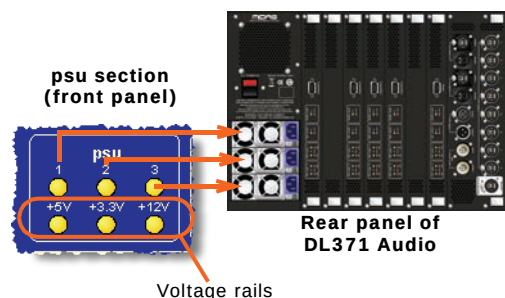


psu panel

This panel monitors the three supply voltages and the three voltage rails.

Each of the three LEDs in the top row represents a PSU. They illuminate when their respective PSU is supplying power to the unit after it has been switched on via the **D.C. POWER ON** switch. During operation, at least two of the PSUs must be supplying power to the unit.

The bottom row of LEDs represent the three voltage rails (+5V, +3.3V, and +12V), which are common to each PSU. The LEDs illuminate to show that their respective rail is live. When the unit is powered, all three LEDs should be illuminated; if not, see “Voltage rail failure” on page 21.



Snake X and Y panel

The snake panel monitors the communications on the copper/optical cabling for both the X and Y networks. Each cable type has an **ok** and an **error** LED for communication status indication, as follows:

- The **ok** LED (green) pulsates when the link is synchronised between the router and end point.
- The **error** LED (red) illuminates when either no communications or a fault are detected.



DSP control panel

The control panel has seven LEDs (green) that indicate the Ethernet control activity and link status of each fitted module, as follows:

- Constantly illuminated = linked.
- Flashing = data activity (communication is good).
- Extinguished = bad/no module fitted.



DSP audio panels

There are two DSP audio panels, ring 0 and ring 1, that indicate communication status of the DL371A modules. There are seven sets of LEDs in each panel (one per module) comprising an **ok** LED and an **error** LED, which indicate the following:

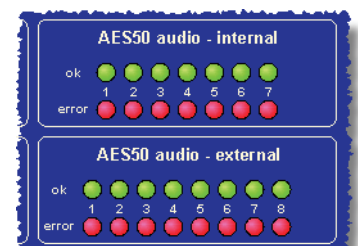
- Green **ok** LED illuminated = communication is good.
- Green **ok** LED extinguished = bad/no module fitted.
- Red **error** LED illuminated = communication error.



AES50 audio panels

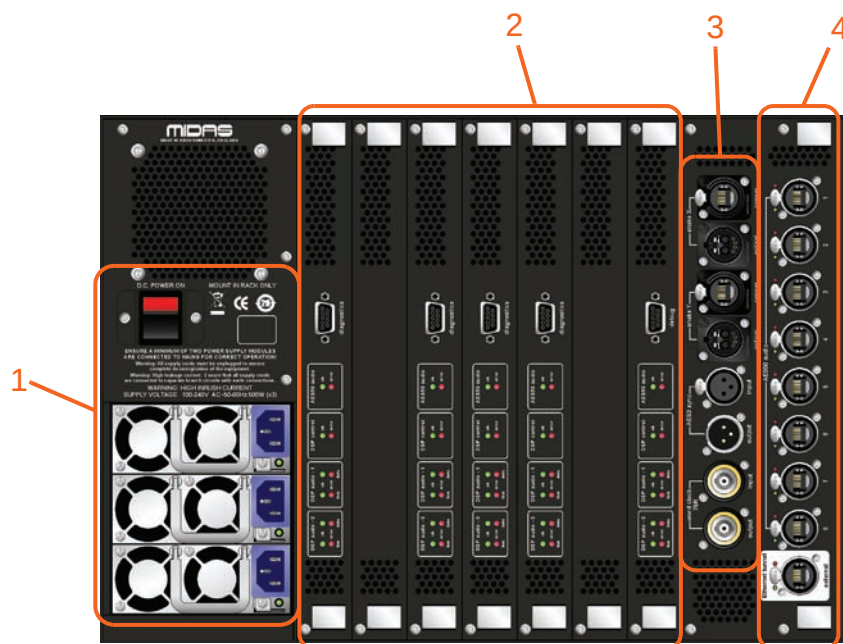
There are two AES50 audio panels, internal and external, that indicate communication status of the AES50 audio connections. There are seven sets of LEDs in each panel (one per module) comprising an **ok** LED and an **error** LED, which indicate the following:

- Green **ok** LED pulsating = communication is good.
- Green **ok** LED (internal only) extinguished = bad/no module fitted.
- Red **error** LED illuminated = communication error.



Chapter 3: Rear Panel

The rear panel of the DL371 Audio System Engine has three main sections, as shown below.



1 Mains power sockets and DC isolator switch; see “Mains input” on page 10.

2 User-configurable module panel; see “DSP modules” on page 11 for module description. (The above diagram shows the default configuration.)

3 Connector panel; see “Connector panel” on page 12.

4 Router panel; see “Router panel” on page 13.

Mains input

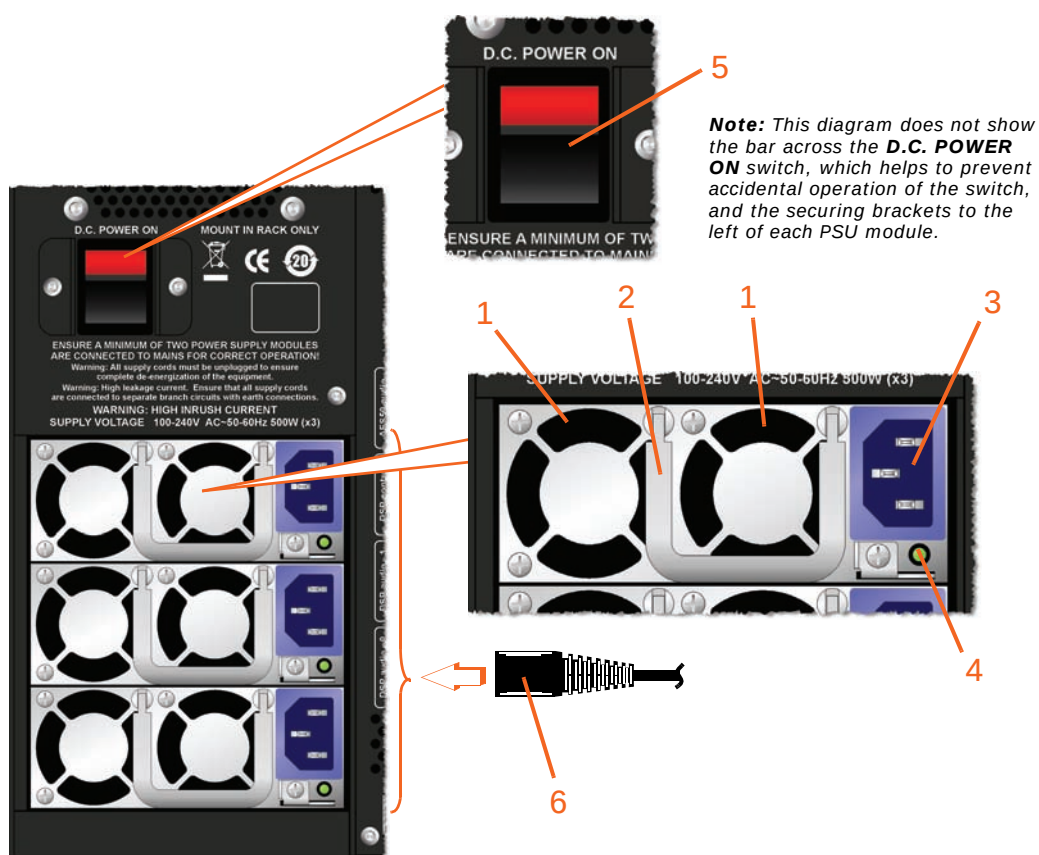


WARNING!
HIGH INRUSH CURRENT.



Caution:
You must ensure that a minimum of two PSU modules are powering the unit for correct operation (see “Switching the PRO6 Control Centre on/off” on page 52).

The mains input section comprises three modular sets of mains input and fan assemblies — known as power supply unit (PSU) modules — and a DC isolator switch. The modules are N+1 redundant and a minimum of two must be used to power the unit. Each PSU module comprises a single chassis that slides in and out of the unit to facilitate easy replacement.

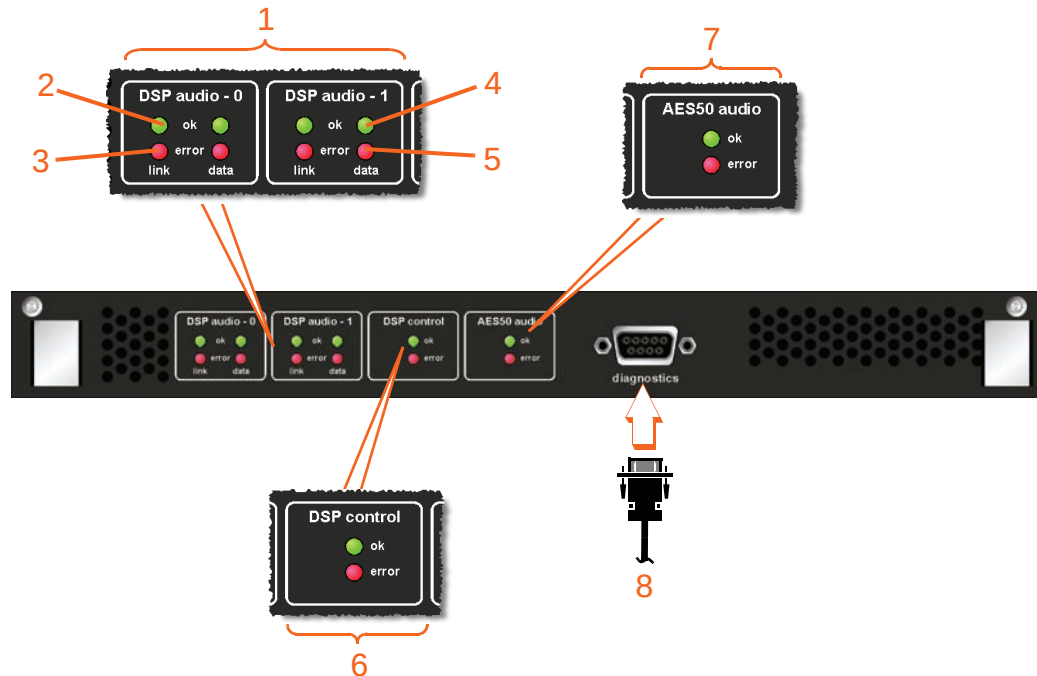


- 1** Fan outlet vent.
- 2** Handle for mains input and fan assembly removal.
- 3** Mains IEC socket.
- 4** Power on/off indicator LED. This has the same functionality as the power supply LEDs in the **psu** section of the front panel (see “psu panel” on page 6).

- 5** **D.C. POWER ON** switch, switches the power to the unit on/off.
- 6** Mains IEC connector (locking type). This connector has a catch on the side that holds the connector in place when it is inserted in the mains socket. The catch has to be pressed to release it before the mains IEC connector can be removed from the socket.

DSP modules

Seven module slots in the rear panel each accept the following module. However, in the standard PRO6 configuration, only five modules are fitted to the DL371 Audio System Engine.



1 DSP audio sections 0 and 1 with two sets of LEDs (**link** and **data**) for status indication.

2 Link **ok** LED (green) illuminates to indicate that link is active (link is good).

3 Link **error** LED (green) illuminates to indicate that link has failed.

4 Data **ok** LED (red) illuminates to indicate valid audio and valid aux data (data is good).

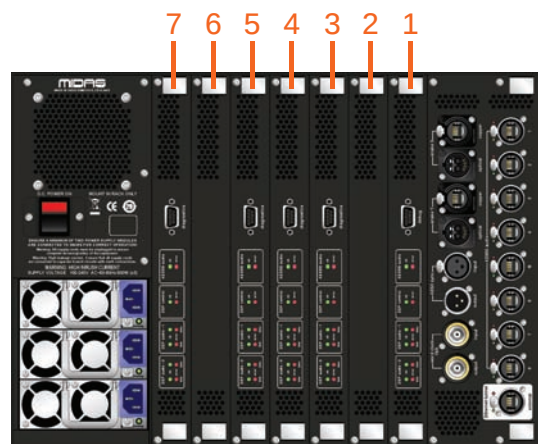
5 Data **error** LED (red) illuminates to indicate there is no audio.

6 **DSP control** section has the same functionality as the one on the front panel (see "DSP control panel" on page 7).

7 **AES50 audio** section, has the same functionality as the **AES50 audio - internal** section of the front panel (see "AES50 audio panels" on page 7).

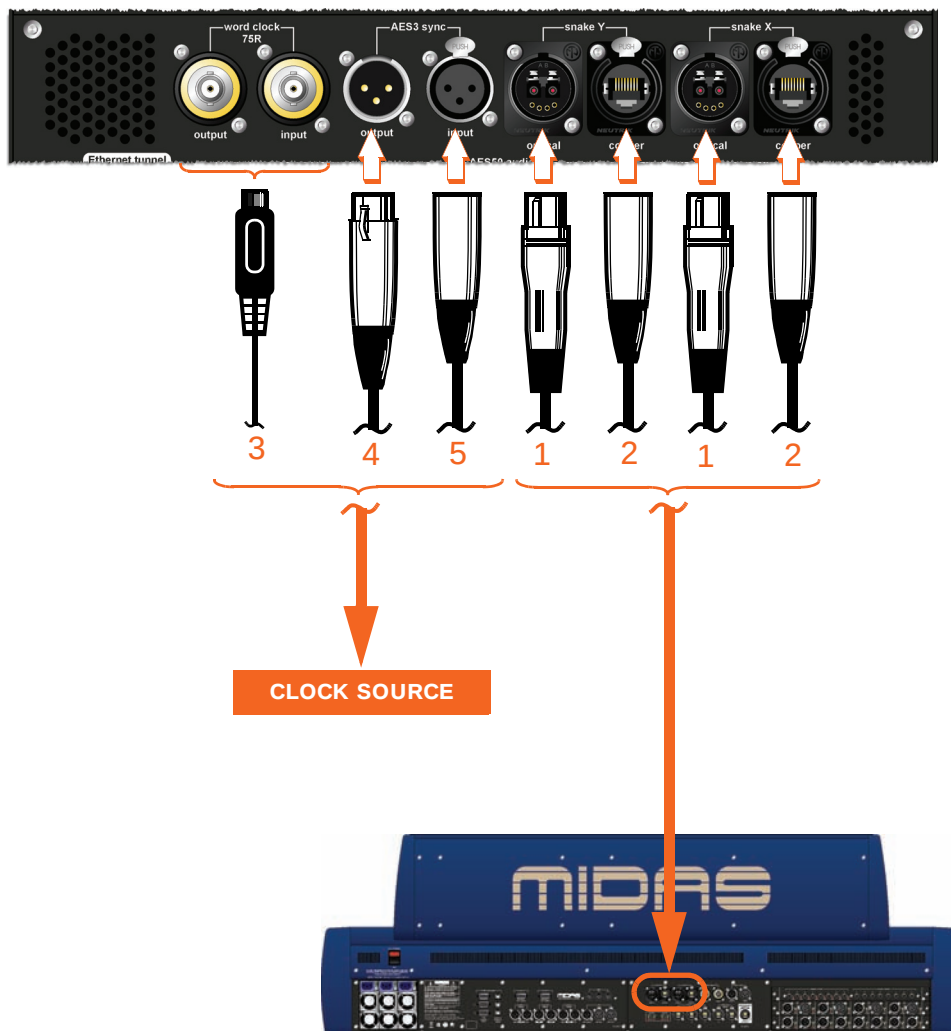
8 **diagnostics** 9-way D-type connector socket (female). For use by service personnel only.

The modules are numbered as shown in the following diagram.



Connector panel

The connector panel houses the snake connectors (to console) and the word clock and AES3 sync connectors for connecting the user-selected clock source for synchronisation.



1 optical Neutrik OpticalCon® snake X and Y sockets for connecting the optical (fibre optic) snake to the console.

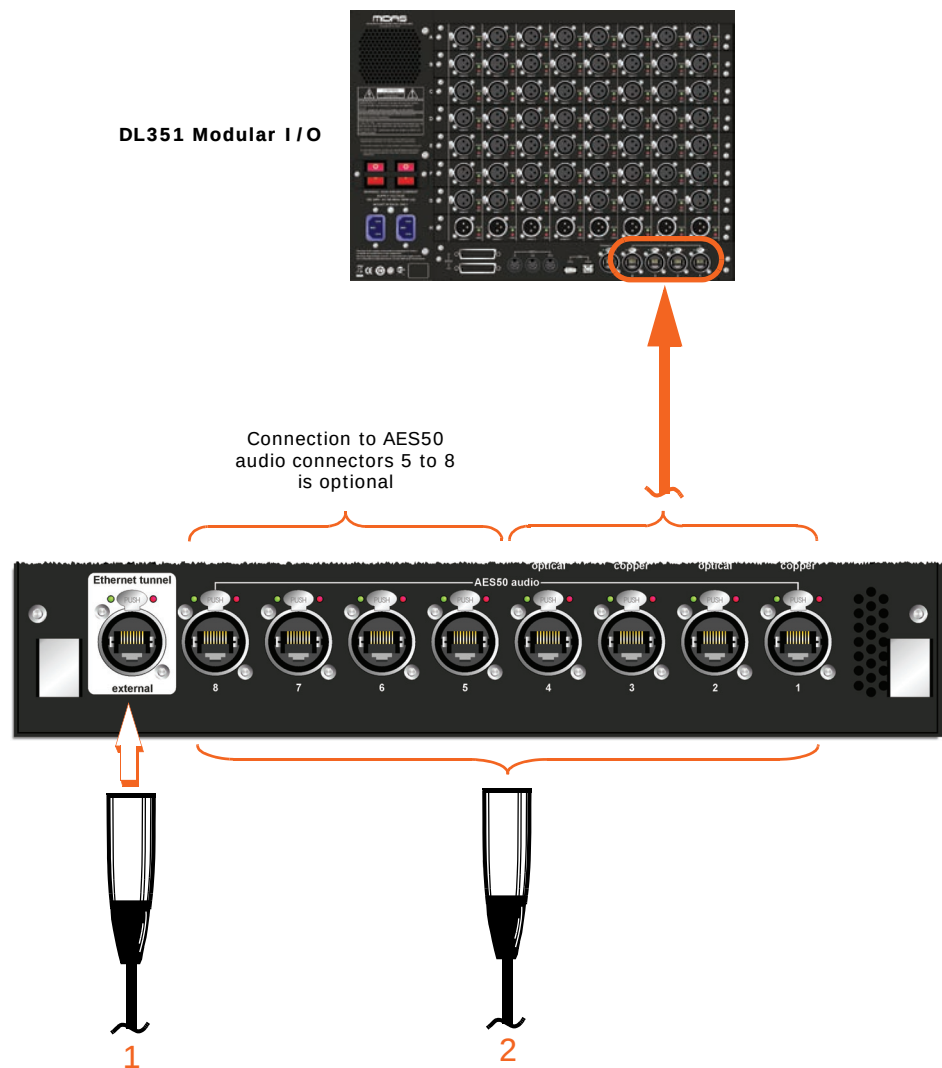
2 copper Neutrik EtherCon® snake X and Y sockets for connecting the copper snake to the console.

3 word clock 75R section comprises **input** and **output** BNC cable sockets for synchronisation with routers.

4 AES3 sync section comprising **input** (female) and **output** (male) XLR chassis connectors.

Router panel

The router panel houses the AES50 audio connectors and Ethernet tunnel connector.



1 Ethernet tunnel external connector for connecting 'tunnelling' Ethernet.

2 **AES50 audio** section with eight EtherCon® sockets. Sockets 1 to 4 are for connection to the DL351 Modular I/O, while the remaining four (sockets 5 to 8) are optional.

Chapter 4: Getting Started

This chapter shows you how to connect up and switch on the DL371 Audio System Engine unit.

Connecting up

Refer to Figure 2 “Standard system configuration” on page 50.

Connect up the your DL371 Audio System Engine unit as follows:

- **Snake** — connect the two fibre optic/copper snakes to the required X and Y sockets on the rear panel of the DL371 Audio System Engine unit and then to the rear of the PRO6 Control Centre. See “Connector panel” on page 12.
- **AES50** — connect the four **AES50 audio** sockets (1 to 4) on the rear panel of the DL371 Audio System Engine unit to the corresponding **AES50 audio** sockets on the rear panel of the DL351 Modular I/O unit. See “Router panel” on page 13.
- **Synchronisation (optional)** — connect the **word clock** or **AES3 sync** connectors to the required clock source.
- **Mains power supply** — connect the mains cables. See “Powering the unit” on page 15.

Powering the unit

This section shows you how apply power to the unit, and also how to completely isolate the unit electrically.



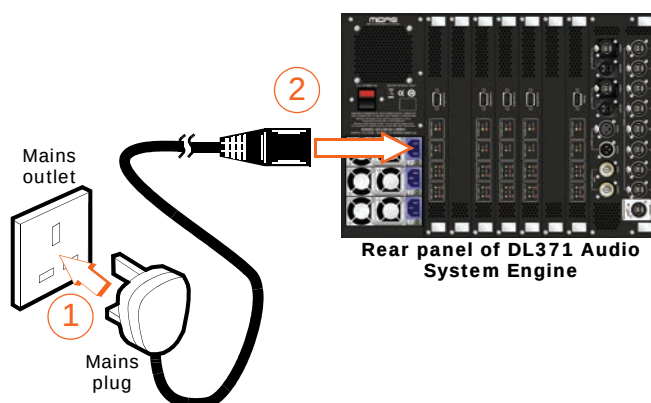
Caution:

You must ensure that a minimum of two power supply modules are powering the unit for correct operation (see “Switching the PRO6 Control Centre on/off” on page 52).

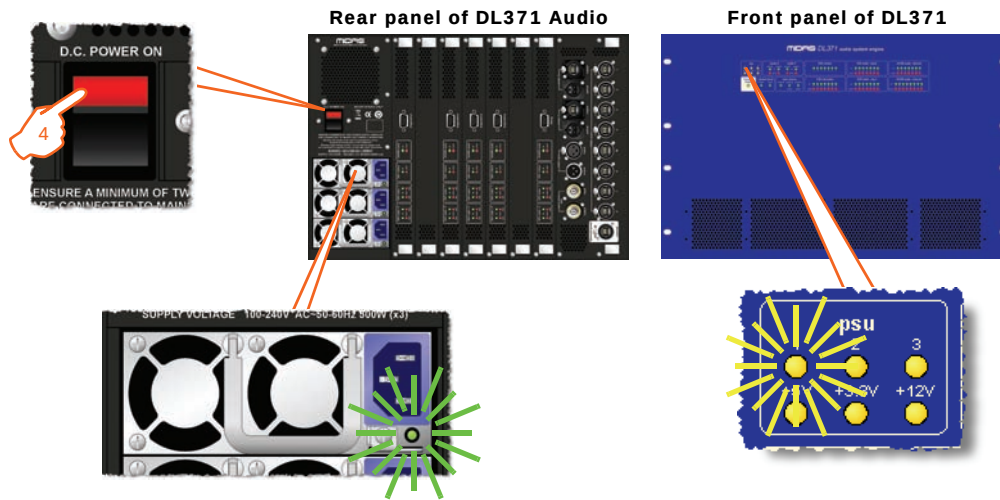
>> To apply power to the unit

Observing the Caution above, carry out the following to power up the unit.

- 1 Insert the mains plugs of the mains leads into mains power outlets (see “Power” on page xi).
- 2 Making sure the power supply is off at the mains power outlets, plug their IEC connectors into the mains input sockets in the rear panel of the DL371 Audio System Engine unit.
- 3 Switch on the mains power outlets.



- 4 Apply power to the unit by switching on the **D.C. POWER ON** switch. The green LED adjacent to each mains input socket, and its associated yellow LED in the **psu** section (front panel) will illuminate if their PSU is supplying power to the unit. This is illustrated in the diagram below, which uses PSU 1 as an example.



>> To remove power from (electrically isolate) the unit

- 1 Switch off the **D.C. POWER ON** switch.
- 2 Switch off the power at each mains outlet.
- 3 Disconnect the mains IEC connectors from the mains power sockets at the rear of the unit. Press the connector's 'button' to release the catch before pulling it out of the socket.

The unit is now electrically isolated.

Operation

As the DL371 Audio System Engine is operated solely from the PRO6 Control Centre, there are no operating procedures associated with it. Refer to the PRO6 Control Centre Owner's Manual (part number DOC02-DL3) for more details.

Appendix B: Technical Specification

This appendix contains the technical specifications for the DL371 Audio System Engine. For system-related DL371 Audio System Engine specifications and for full technical specifications for the XL8 Live Performance System, please refer to the Owner's Manual (part number DOC02-DL3).

Due to a policy of continual improvement, Midas reserves the right to alter the function or specification at any time without notice.

General specifications

Dimensions	7U x 410 mm deep
Net weight	30 kg
AC requirements	100V to 240V, 50 to 60Hz
Power requirements	500W x 2 (minimum)
Operating temperature range	+5°C to +40°C
Storage temperature range	-20°C to +60°C

Inputs and outputs

System inputs and outputs

System connector	3 x AES50 (24 channels of bi-directional digital audio) on EtherCon® XLR
N+1 connector	1 x AES50 (24 channels of bi-directional digital audio) on EtherCon® XLR providing dual redundant back up
System expansion connector	4 x AES50 (24 channels of bi-directional digital audio) on EtherCon® XLR
Snake connector (copper)	HyperMac (192 channels of bi-directional digital audio) on EtherCon® XLR
Duplicate snake connector (copper)	HyperMac (192 channels of bi-directional digital audio) on EtherCon® XLR
Snake connector (fibre)	HyperMac (192 channels of bi-directional digital audio) on OpticalCon® XLR
Duplicate snake connector (fibre)	HyperMac (192 channels of bi-directional digital audio) on OpticalCon® XLR

Miscellaneous inputs and outputs

Word clock IN connector	BNC
Word clock OUT connector	BNC
AES3 Sync IN connector	3-pin XLR
AES3 Sync OUT connector	3-pin XLR
External connector	EtherCon® XLR

Appendix B: Replacing A Module



Caution:

The module is a static-sensitive device. Proper grounding and electrostatic discharge (ESD) precautions are required before handling the module.

The design of the DL371 Audio System Engine makes module replacement very easy and straightforward. The unit has rack guides in each of the seven module positions so that the modules can slide easily in and out. Each module is held in place by two screws.

To replace a module the only tool you will need is a Torx T10 screwdriver.

>> To remove a module

- 1** Switch off and electrically isolate the unit, as detailed in “To remove power from (electrically isolate) the unit” on page 16. Then, disconnect all connectors from the rear panel.
- 2** On the module you want to take out, remove the two securing screws (top and bottom), as shown in Figure 1.

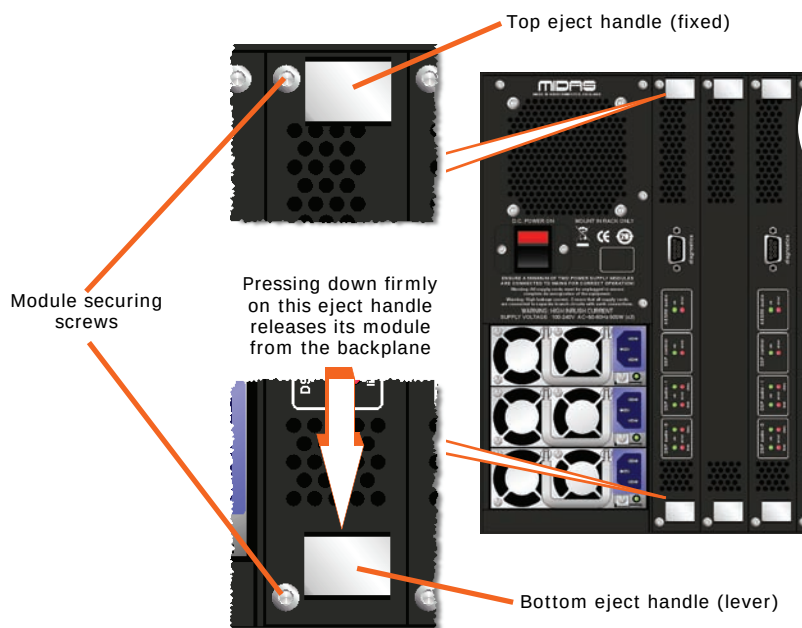
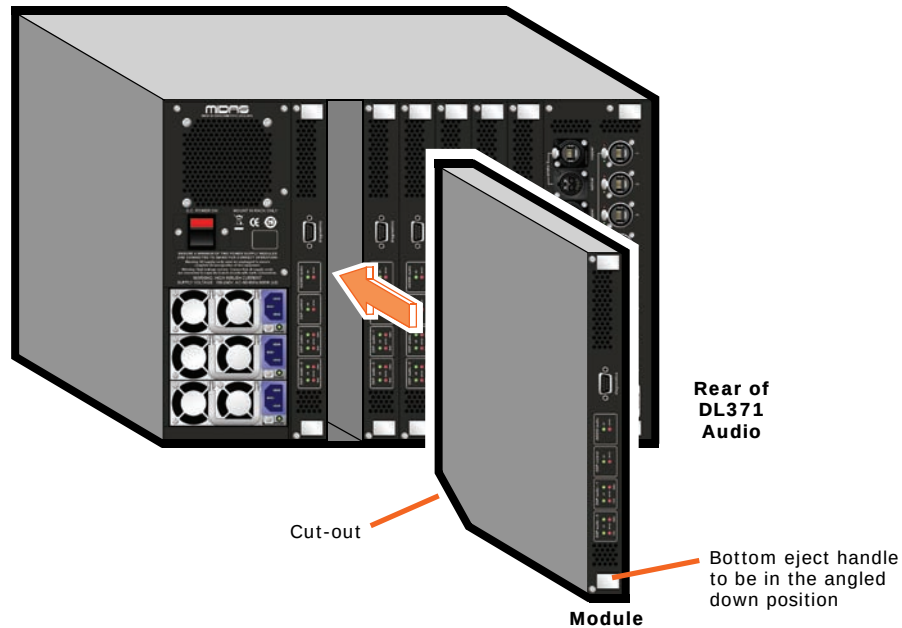


Figure 1: Module fixings

- 3** Disengage the module from the backplane by pressing down firmly on the bottom eject handle (see Figure 1).
- 4** Carefully pull out the module by its top and bottom eject handles.

>> To fit a module

- 1** Make sure that the unit is switched off and electrically isolated (see “To remove power from (electrically isolate) the unit” on page 16).
- 2** At the rear of the unit, offer up the rear of the module to its required module position. Make sure that the module is in the correct orientation and that the bottom eject handle is in the angled down position, as shown in the following diagram.



- 3** Insert the module into the empty slot and push it carefully, but firmly, into position. The bottom eject handle will clip back up into its fully fitted position (matching the top eject handle) when the module is in place.
- 4** Secure the module using the two securing screws (see Figure 1 on page 19).
- 5** Connect up the unit and switch it on (see Chapter 4 “Getting Started”).
- 6** Check that the new module is functioning correctly (see “DSP modules” on page 11).

Appendix E: Service Information

This appendix provides instructions on routine servicing and cleaning, and gives details on equipment disposal.

Routine maintenance

To help keep your DL371 Audio System Engine unit in good working order and to make sure it gives you optimum performance, we recommend that you carry out the following:

Monthly

- Clean the unit, as detailed in “Cleaning the unit” on page 35.
- Check functionality of the LEDs. You can quickly carry out a visual check by switching the unit off and then on again, as they are all activated during power-up.
- Check functionality of equipment.

Yearly

- Clean the internal fans, see “Cleaning the internal fans” on page 21.

Cleaning

Switch off the unit and electrically isolate it from the mains *before* cleaning; see “To remove power from (electrically isolate) the unit” on page 16.

Cleaning the unit

Clean the unit using a dry, lint-free cloth. Do not use harsh abrasives or solvents. When cleaning the unit, take great care not to damage the pushbuttons.

Cleaning the internal fans

The unit's internal fans need to be cleaned regularly to remove the build of dust, dirt etc. We recommend that they are cleaned at least once a year, provided the unit has been operated under normal conditions. However, if the operating conditions are more adverse or extreme, for example, if the unit is operated in the vicinity of smoke machines, new carpets etc., this frequency should be increased accordingly.

This procedure must be carried out by a fully qualified service engineer. If you have any queries, contact Midas; details can be found at the front of this manual.

Voltage rail failure

When the unit is powered, all three voltage rails must be live. Their status is monitored by the three LEDs in the **psu** section of the front panel (see “psu panel” on page 6), which should all be illuminated. If any one of the LEDs is extinguished, it is probably an indication of a serious problem and you should contact Midas Technical Support.

Hot unplugging / plugging a PSU module

**Caution:**

While it is possible to replace a PSU module with power connected to the other two, this may cause a momentary interruption or noise on the audio outputs of the unit. Always mute any loudspeaker system before performing this procedure.

If you have to replace a PSU module, it can be done with the DL371 Audio System Engine unit switched on. This is known as “hot unplugging” (removing) and “hot plugging” (fitting), and will enable you to change it quickly and save you having to disconnect the cables from the unit.

>> To hot unplug / plug a PSU module

- 1** Mute all outputs (see **Caution** above).
- 2** Switch off the power at the mains power outlet of the PSU you want to remove.
- 3** Remove the mains IEC connector from the PSU module.
- 4** Remove the two screws (left side of PSU module) securing the PSU module to the rear of the unit.
- 5** Pull out the PSU module, using its handle.
- 6** Insert the new PSU module.
- 7** Plug the de-energised mains IEC connector into the PSU.
- 8** Apply power to the PSU by switching on the power at its mains power outlet.
- 9** Check for correct operation of the new PSU module. For example, by monitoring its LEDs (see “psu panel” on page 6 and “Mains input” on page 10).

Equipment disposal

When this equipment has come to the end of its useful life, its disposal may come under the DIRECTIVE 2002/96/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 27 January 2003 on waste electrical and electronic equipment (WEEE).

Hazardous substances in WEEE contaminate water, soil and air and ultimately put at risk our environment and health. The directive aims to minimize the impacts of WEEE on the environment during their lifetimes and when they become waste.

The WEEE directive addresses the disposal of products when they have reached the end of their life and contributes to the reduction of wasteful consumption of natural resources. This will help to reduce pollution, and protect the environment and ourselves.



If this equipment carries a ‘crossed-out wheelie bin’ (shown left), please do not dispose of WEEE as unsorted municipal waste but collect and dispose of in accordance with local WEEE legislation. The horizontal bar underneath indicates that the product was placed on the EU market after 13th August 2005.

For WEEE disposal; see our website at www.midasconsoles.com for information.

Appendix F: PRO6 Live Audio System

This chapter provides a detailed overview of the XL8 Live Performance System.

Standard system configuration

The PRO6 Live Audio System is a very powerful and flexible audio processing system that provides a complete solution for any audio mixing and signal distribution application in a live sound environment.

Despite its compact size the standard PRO6 offers 56 channel inputs, eight auxiliary returns, 41 buses (16 auxes, 16 matrices, three masters and six solos), eight on-board effects processors, PEQs (four-band on inputs and six-band on outputs), eight standard (up to 36 maximum) 31-band GEQs, eight configurable stereo effects¹, 5.1 surround panning and comprehensive, easy-to-use routing. PRO6 automation provides up to 1,000 scenes with snapshot save/recall capability and global edit, and show file archiving.

The PRO6 Control Centre forms the core of the PRO6 Live Audio System, which also includes two 19" rack units — a DL351 Modular I/O (7U) and a DL371 Audio System Engine (7U) — that are interconnected by a networked data system. The network carries both proprietary control data and open architecture AES50 digital audio, and uses readily available standard cabling and connectors. The PRO6 uses a proven stable Linux operating system. All of the control centre's internal and network routing ("patching") is managed via the graphical user interface (GUI).

Operation of the control surface is intuitive, unique and easy. Its layout is based on familiar analogue lines to retain that 'analogue' feel. To manage the numerous channels, the PRO6 Control Centre utilises VCA/POP groups and colours, and additionally there are various navigational controls that aid quick channel/bus access and selection. A daylight-viewable GUI at the top of the control surface assists operation and provides extra functionality.

The PRO6 Live Audio System is tolerant of many types of hardware or software failure. To achieve this the system employs dual redundancy, where a key component has an identical redundant spare that is ready to take over should it fail. Other failure scenarios are managed by the N+1 principle, where redundant components form an acceptable fraction of the system.

The Klark Teknik DN9696 Recorder can be used with the PRO6 Live Audio System for live multi-track recording and 'virtual' sound check. Optional equipment includes the XL8's DL451 I/O and DL431 splitter, and the DN9331 RapidE for remote GEQ operation.

1. Each can be configured to generate four additional GEQs, making a total of 36 available on the control centre (plus one stereo effect).

Key features

Please remember, the PRO6 is not just a console, it's a LIVE AUDIO SYSTEM!

- **High channel count** — 56 mixed primary inputs (sourced from up to 112 input locations) and 35 output channels.
- **Control centre** — Small and very compact with an exciting but familiar and ergonomic control surface, enhanced by a two-screen GUI.
- **Performance** — Reduced price, scale and features, but still with XL8 audio performance.
- **Operation** — Easy to use with responsive interpolated controls and fast, intuitive human interfaces that combine to produce that familiar *analogue* feel.
 - **User interface (speed and feel)** — VCA groups (console comes to you!); POP groups (console comes to you!); muscle memory (E-zone and D-zone on channel strips, which have paged controls that do not change function); input and output fast zones; electronic colour coding; and dedicated motorised master output faders.
 - **User interface (status visibility)** — Dual daylight-visible screens and integral surface illumination; metering (23 discrete 20-segment LED meters), discrete metering for dynamics, and *all meters all of the time*; “ST” assign switch; and eight channels of key data plus a single channel strip on both GUI screens.
- **Traditional Midas and Klark Teknik audio quality:**
 - **Headroom** — High headroom, which is well behaved, even when *pushed a little too hard*.
 - **Mic amps** — High quality, overload tolerant microphone amplifier per input.
 - **Dynamics** — High quality dynamic processing with traditional *analogue* artefacts. Midas dynamics has four styles on the inputs and five on the outputs.
 - **EQ** — Fully interpolated phase shifting EQ for that “Midas” sound.
 - **PEQ** — High quality EQ with the “Midas” sound. Each output has six-band parametric EQ, while the inputs have four bands each. Midas sound quality and ‘feel’ on the EQ’s four filters.
 - **GEQ** — Up to 36 (eight if all stereo effects are being used) Klark Teknik quality GEQs with unique on-board fast access controller and control from RapidE.
 - **Effects** — High quality effects processing with traditional artefacts. Up to eight stereo effects units.
- **Patching** — Unique simple-to-use routing system allows you to carry out all your routing needs and also configure any attached devices via the GUI.
- **Navigation** — VCA-based and other advanced intuitive paging/navigation methods.
- **Automation:**
 - **Snapshots** — Flexible *snapshot* style save and recall of control settings and cross-scene global edit capability.
 - **Showfiles** — USB connectors for show archiving. Showfiles are both forward and backward compatible across firmware versions.
- **Metering** — Comprehensive metering. The GUI can show all of the meters all of the time.
- **Dual operation** — Capable of supporting two-man operation, which is ideal for festival situations.
- **Storable preferences** — Storable user operational preferences to suit specific applications, for example, FOH/MON.
- **Broadcasting** — 5.1 surround panning for broadcast markets.

- **Latency** — Low and managed latency through the system. Minimal latency and fully time aligned.
- **Cabling** — Cat 5e or fibre optic snakes. Standard system has reduced cabling as compared to any other available solution.
- **System design and network:**
 - Integrated open-architecture AES50 digital audio distribution.
 - Up to 100 metres (Cat 5e) or up to 500 metres (optical fibre) of dual redundant connectivity between hardware elements.
 - Automatic integral delay management system - audio outputs time and phase coherent.
 - Flexible, expandible hardware system includes analogue and digital I/O options for flexible system integration.
 - Ethernet TCP-IP and USB tunnelling for third parties.
 - KVM (keyboard, video and mouse) switching on control centre.
 - Fast flexible audio and control system architecture.
 - Modular digital and analogue I/O options.
 - Advanced automation and system operating preferences.
 - PRO6 is flexible and the system can be customised with the needs of the install.
 - VGA outputs for additional screens.
- **Reliability** — High reliability with some redundancy and other back up contingencies.
 - Failure-tolerant of any single failure of hardware or software.
 - Proven, stable Linux operating system.
 - Dual redundant control surface master controllers and PSUs.
 - Duplicated (N+1) network for redundancy.
 - Control centre has triple redundant power supplies.
 - DL351 Modular I/O (stage box) has dual redundant power supplies.
 - DL371 Audio System Engine (stage box) has N+1 (optional) modules with three (N+1) power supply units (PSUs).
- **Service and support** — 24/7 global telephone support. Service/support centres in US, UK and Singapore.

Applications

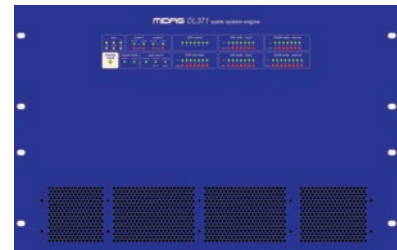
The PRO6 is the 'work horse' mid- to high-end Midas Digital Console System, akin to the 'industry standard' Heritage 3000. Although the PRO6 is designed for the traditional touring live sound environment, it is also ideal for medium-sized theatre, small house of worship installations and broadcast. So, being a truly multi-function console in the Midas tradition, the PRO6 is suitable for many applications, such as:

- Live sound touring MON or FOH duties.
- Live sound small theatre MON or FOH duties.
- Live sound house of worship MON or FOH duties.
- Live sound broadcast mixer with basic 5.1 surround capabilities and monitoring.

System components (standard supply)

The PRO6 Live Audio System is modular, allowing for some variations in physical placement and system size. The standard PRO6 touring system package is configured as a 14U rack (containing two DL3n1 units) in a single, easily portable flight case, with an equally portable, flight-cased control surface and minimal cabling. This package comprises:

- 1-off PRO6 Control Centre (in a flight case). Its user-configurable modular I/O rack (rear panel) will be populated with the following modules (from top to bottom):
 - DL443 analogue Jack I/O module, providing eight Jack line inputs and eight Jack line outputs.
 - DL441 analogue input (mic) module, providing eight balanced mic/line inputs.
 - DL442 analogue output module, providing eight balanced line outputs.
- 1-off main 14U rack (in a flight case), which houses:
 - 1-off DL351 Modular I/O. This is populated with seven DL441 analogue input modules (56 main inputs) and a DL442 analogue output module. There are a total of 56-off XLR mic/line inputs provided on the system.
 - 1-off DL371 Audio System Engine. This is populated with five cards, the two empty slots being blanked off. (If the optional N+1 redundant DSP module card is fitted, there will be six cards and one empty slot.)
 - 4-off interconnecting (N+1) rack Cat 5e copper cables.
 - 2-off interconnecting (dual redundant) gigabit HyperMac Cat 5e copper cables, each 100 m long.
 - 8-off mains cables.



FOH and MON

The PRO6 Live Audio System can be used as a front of house (FOH) or stage monitor (MON) system.

System buses

The PRO6 has comprehensive system buses to suit demanding applications, comprising:

- 6-off solo buses, routable from all locations and allowing for dual operator and 5.1 use.
- 3-off master buses, routable from the 56 inputs and eight aux inputs, and six aux buses.

- 16-off matrix buses, routable from the 56 inputs and eight aux inputs, and 16 aux buses and three master buses.
- 16-off aux buses, routable from the 56 inputs and eight aux inputs.

All the bus routings (above) provide simultaneous and time aligned mixing of all the sources, which will be defeatable for minimum latency requirements.

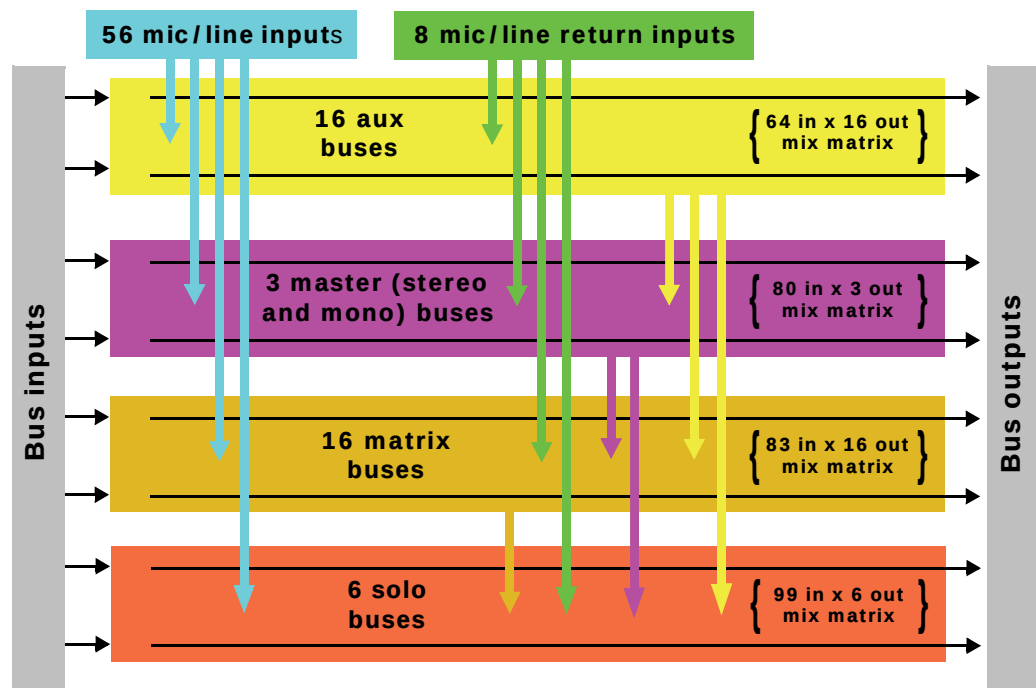
For monitor mixing, the master, matrix and aux buses can all be routed directly from the input channels with independent level controls providing up to 35 monitor mix buses.

For traditional FOH sub group mixing, any (or all) of the aux buses can change to operate post-channel fader and pan (that is, aux gain fixed at unity).

Auxiliary inputs have two modes of operation: effects return and input channel. In input channel mode (default) they will have aux, master and matrix routing, insert points and EQ (like regular inputs channels), but no dynamic capability. They are controlled like regular inputs from the input bay and channel strip, and are time aligned to the stage like regular input channels. In effects return mode the channels have routing to matrix and masters only and no insert or dynamic capability. They are controlled from the aux return area and time aligned to the effects engines.

Mix matrix

Ultimately, the mix matrix defines the capability of the PRO6 Control Centre. Probably the best way to imagine the mix matrix is to think of an analogue console layout, where inputs run vertically and buses run horizontally. A mix matrix is usually defined as the number of buses and the quantity of simultaneously-mixable inputs there are per bus. The following diagram illustrates the capability within the control centre.



Processing

Although the control centre system allows for considerable insertion of external processing it also embodies more than enough internal high quality processing to eliminate the need for this, in the interests of simplicity and reduced overall system size, weight and cost.

Processing components

The processing available is:

- 56 x 12 or 24dB/oct. high pass filters.
- 56 x 6 or 12dB/oct. low pass filters.
- 91 x compressor/limiters with side chain filtering and multiple operating “signatures”.
- 56 x gates with side chain filtering.
- 64 x 4-band parametric EQs with multiple shelf “modes”.
- 35 x 6-band parametric EQs with hi/lo pass modes.
- 8 assignable 31-band graphic EQs.
- 28 additional 31-band graphic EQs that utilise effects processor digital signal processing (DSP), reducing the available effects quantity stated below.
- 8 stereo effects processors including Reverbs, Delay, Flange, Phase, Dual (stereo) Graphic and Pitch Shifter.

Note: More effects are planned to be added in the future, which may include multi-band compression, dynamic EQ etc.

Input channel processing

Each of the 56 full-function input channels has:

- Analogue and digital gain.
- Phase reverse switch.
- Input delay.
- Swept high pass filter with choice of two filter slopes.
- Swept low pass filter with choice of two filter slopes.
- Frequency-conscious compressor with choice of four compression styles.
- Frequency-conscious noise gate with external side chain.
- Insert point.
- Treble EQ filter with choice of four filter types.
- Parametric hi-mid EQ filter.
- Parametric lo-mid EQ filter.
- Bass EQ filter with choice of four filter types.
- Routing via level controls to 32 mix buses.
- Routing via pan control to left and right master buses.
- Routing to mono master bus.
- Panpot (SIS™).
- Direct output.

Each of the eight auxiliary inputs has:

- Input gain.
- Source from internal FX or external input.
- EQ.
- Fader.
- Panpot (SIS™).
- Routing via level controls to the 16 matrix buses.
- Routing via pan control to the left, right and mono master buses.

Mix channel processing

Each of the 16 auxiliary mix buses has:

- Subgroup, auxiliary or mix minus modes.
- Dual mono or stereo pair modes.
- Six-band PEQ.
- Optional 31-band GEQ (replaces PEQ).
- Frequency-conscious compressor with choice of five compression styles.
- Insert point.
- Routing via level controls to the 16 matrix buses.
- Routing via pan control to the left, right and mono master buses.
- Direct input.

Each of the 16 matrix buses has:

- Six-band PEQ.
- Optional 31-band GEQ (replaces PEQ).
- Five-mode frequency-conscious compressor with soft clip limiter and external side chain.
- Insert point.
- Direct input.

Output channel processing

Each of the 16 matrix buses has:

- Six-band PEQ.
- Optional 31-band GEQ (replaces PEQ).
- Five-mode frequency-conscious compressor with soft clip limiter and external side chain.
- Insert point.
- Direct input.

Each of the three master output buses has:

- Six-band PEQ.
- Optional 31-band GEQ (replaces PEQ).
- Five-mode frequency-conscious compressor with soft clip limiter and external side chain.
- Insert point.

- Direct input.
- Routing via level controls to 16 matrix buses.

Effects processing and GEQs

The PRO6 contains eight mono Klark Teknik (KT) GEQs and seven effects processors as standard.

The seven effects processors can be freely chosen from:

- KT DN780 reverb.
- Delay.
- Flanger.
- Phaser.
- Pitch shifter.
- SQ1 dynamics.
- Stereo 3-band compressor.

The eight mono KT GEQs can be patched into any output. There are many patching options for the effects processors:

- Assign to any insert send/return.
- Assign to any pool, in or out.
- Assign FX out to aux return.
- Assign FX in to aux send (post-fade).
- Assign FX out to bus direct in.
- Assign FX in to channel direct out.

A Klark Teknik DN9331 RapidE motorised fader GEQ controller can be used with the PRO6. This unit provides rapid adjustments of the graphics with real hardware, and not a mouse and screen. The graphic channel is selected either by the SOLO button (solo tracking system (STS™)) on the PRO6 Control Centre or by buttons on the RapidE itself.

Audio physical connections

The total number of audio connections, that is, the XLR count, for a standard PRO6 Live Audio System is 96. This includes dedicated and configurable XLR connections. The dedicated XLR connections on the DL351 Modular I/O comprises 56-off mic/line inputs.

All of the configurable connections are on the PRO6 Control Centre, which can be freely located at the FOH or on stage. Three banks of sockets (eight XLRs each) are available for:

- 8-off 1/4" TRS analogue mic/line inputs (returns) and 8-off 1/4" TRS analogue outputs (sends).
- 8-off AES/EBU XLRs providing eight digital inputs and eight digital outputs per module.
- 8-off XLR analogue inputs.
- 8-off XLR analogue outputs.

Surround capabilities

Theatres and broadcast have differing requirements for surround and both are catered for in the PRO6.

Conventional stereo and SIS™ panning is assignable on a channel by channel basis (channel one can be in stereo while channel two can be in SIS™), as follows:

- Stereo left–right routing to master buses.
- SIS™ left–right–centre routing to master buses.

Three additional surround modes operate as follows:

- Quad left – Right – LS – RS routing to Matrix 1, 2, 5 and 6.
- Surround Left – Right – Centre – Surround routing to Matrix 1, 2, 3, and 5 and 6.
- 5.1 Surround Left – Right – Centre – Sub – LS – RS routing to Matrix 1, 2, 3, 4, 5 and 6.

Network

The MidasNET network of the PRO6 utilises the physical connectivity of Ethernet (EtherCon® connectors and Cat 5e/copper cable), but replaces its data protocol with AES50 protocol (implemented as SuperMac) and the HyperMac high capacity system, which are more suited to high quality, low latency audio distribution. The use of the AES standard allows straightforward interfacing with any third party hardware that also utilises this connection.

MidasNET connections carry digital audio, control data and standard Ethernet traffic bi-directionally down a single cable. Cat 5e cable is used for the 'local' connections and the single digital 'snake' (equivalent to a 384-channel analogue multi-core) between control centre and DL371 Audio System Engine. The combination of audio, control, clock and third party Ethernet data in a single network means that the hardware interfaces on a single RJ45 connection.

All system connections are duplicated for full dual redundancy.

Reliability (redundancy)

All critical system connections and most components incorporate integral backup and recovery strategies such as redeployment of resources, N+1 or dual redundancy etc. A modular approach to software, hardware and physical construction also aids reliability and simplifies servicing. The following lists some examples:

- The DL371 Audio System Engine incorporates N+1 redundant power supplies and five modules, with the capability to fit an optional sixth spare module. The standard failure recovery for modules will be redeployment of critical roles typically causing loss of some less important inputs. With the optional sixth module fitted, the system will operate as N+1 and there will be no loss of function after redeployment.
- The router is contained in the same rack and incorporates dual HyperMAC connections in and out.
- The control centre contains dual redundant master controllers, dual GUI screens and N+1 redundant power supplies.
- The I/O is modular in blocks of eight to limit the potential for total audio connection failure and incorporates dual redundant power supplies.

This resilience strategy provides high reliability performance at a reasonable cost because it is designed in from the start and not as an afterthought.

Control software

The operating system of the PRO6 is Linux, which is an open-source, stable, proven operating system (OS). Linux is used in many mission-critical applications worldwide and has allowed Midas' software engineers to write a ground-up system that contains no 'hidden' or unused code. This has resulted in an efficient, compact application, which is quick in operation, quick booting and comparatively easy to debug.

Two copies of the master control software run on separate processors to provide resilience to failure.

GUI

The PRO6 has two, daylight-viewable, TFT screens that provide fast zone and channel strip status indication. Although, any screen can display any information but, in the standard configuration, screen information relates to module location. So, the mix bay screen displays the channel strip and fast zone (12 inputs and 16 outputs), while the master bay screen displays the channel strip input fast zone (four inputs) and all meters. The master bay screen is also generally used for automation, effects, GEQs, third party screens etc., although this is dependent on the current application (concerts will probably be different to theatre) and also operator preference.

The screens are controlled from the primary navigation zone at the bottom of the master bay via two trackballs. A USB keyboard (supplied) is used for text editing.

System card expansion

Additional digital I/O format options will be available later, for example, MADI.

Console linking

You can link two PRO6 Control Centres together. Just connect an AES50 cable from a spare AES50 port on one router to a spare port on another, and then set them up "Generic AES50" connections in the GUI menu's **Patching** screen.

Integration of third party hardware/software

The PRO6 network includes the capability to interface any third party hardware that uses AES/EBU or AES50 digital audio, or standard analogue audio interface.

Each PRO6 AES/EBU input and output has a sample rate converter. Synchronisation to external AES3 interfaces can be:

- Global - via inputs on the routers.
- Local to each input.
- Local to each output (synchronisation to adjacent local output).

Multiple local connections can be at different sample rates.

The use of the AES50 protocol for the transmission of digital audio means that any third party digital audio hardware that features this connection can be connected to the Midas network, and will transfer audio to and from the Midas hardware without any additional interfaces or converters (provided it runs in TDM 96kHz mode). This will be particularly useful as the protocol gains acceptance with recording and playback devices, loudspeaker controllers, audio networking systems, digital amplifiers etc.

PC or MAC computers can use the Ethernet tunnel in the MidasNET system, and can communicate with other computers on the network.

The PRO6 Control Centre features an external video for both screens, and the master bay GUI screen (on the right) also has a three-way KVM switch. Control centre views can be routed to external monitors, and external video sources can be displayed on the control centre.

The KVM switch facilitates the control of three external computers via the screen, trackball and keyboard of the control centre. This is hugely important and means that third party systems can be controlled from within the PRO6 without having to move your head to look at screens placed off to one side. *It also means that there is no need to find somewhere to put multiple keyboards and mice.* Examples are:

- Netmax (AES/EBU audio link initially and CobraNet™ when the 48kHz I/O module is available on PRO6).
- IRIS (for example, for RL amps).
- Wireless mic controllers.
- Your email.
- DVD movies.

Appendix G: Setting Up A PRO6 System

This chapter shows you how to set up a PRO6 Live Audio System to its default configuration.

Note: If you want to set up the PRO6 Live Audio System using a configuration other than the default, please contact Midas Technical Support for details.

Initial set-up procedure

Initial system set-up basically comprises:

- Unpacking and checking the equipment — see “Unpacking the equipment” on page 49.
- Making up a rack — see “Making up a rack” on page 49.
- Connecting up the equipment — see “Wiring instructions” on page 49.
- Powering the equipment — see “Powering the PRO6 system” on page 51.
- Initial patching — refer to the XL8 Live Performance System Owner's Manual or PRO6 Control Centre Quick Reference Guide for details. **It is important to set up the type of snakes connected in the system.**
- Configuring the DL351 unit — see “Setting up the DL351 Modular I/O unit ID” on page 39.

Unpacking the equipment

After carefully unpacking the equipment, check it against the packing list shown in “System components (standard supply)” on page 40 “System components (standard supply)” on page 26.

Save all packing materials, as they will prove useful should it become necessary to transport the equipment later.

Inspect the equipment carefully for any sign of damage incurred during transportation. It has undergone stringent quality control inspection and tests prior to packing and was in perfect condition when it left the factory. However, if the equipment shows any signs of damage, notify the transportation company without delay. Only you, the consignee, may institute a claim against the carrier for damage during transportation.

Making up a rack

In the standard supply, the rack supplied with the PRO6 Live Audio System is fully fitted with the DL351 Modular I/O and DL371 Audio System Engine units.

Wiring instructions

Connect the snake (Cat 5e or fibre optic) to the DL371 Audio System Engine unit and PRO6 Control Centre (see Figure 2 “Standard system configuration” on page 50).

The DL351 Modular I/O and DL371 Audio System Engine units should already be connected together when you receive them.

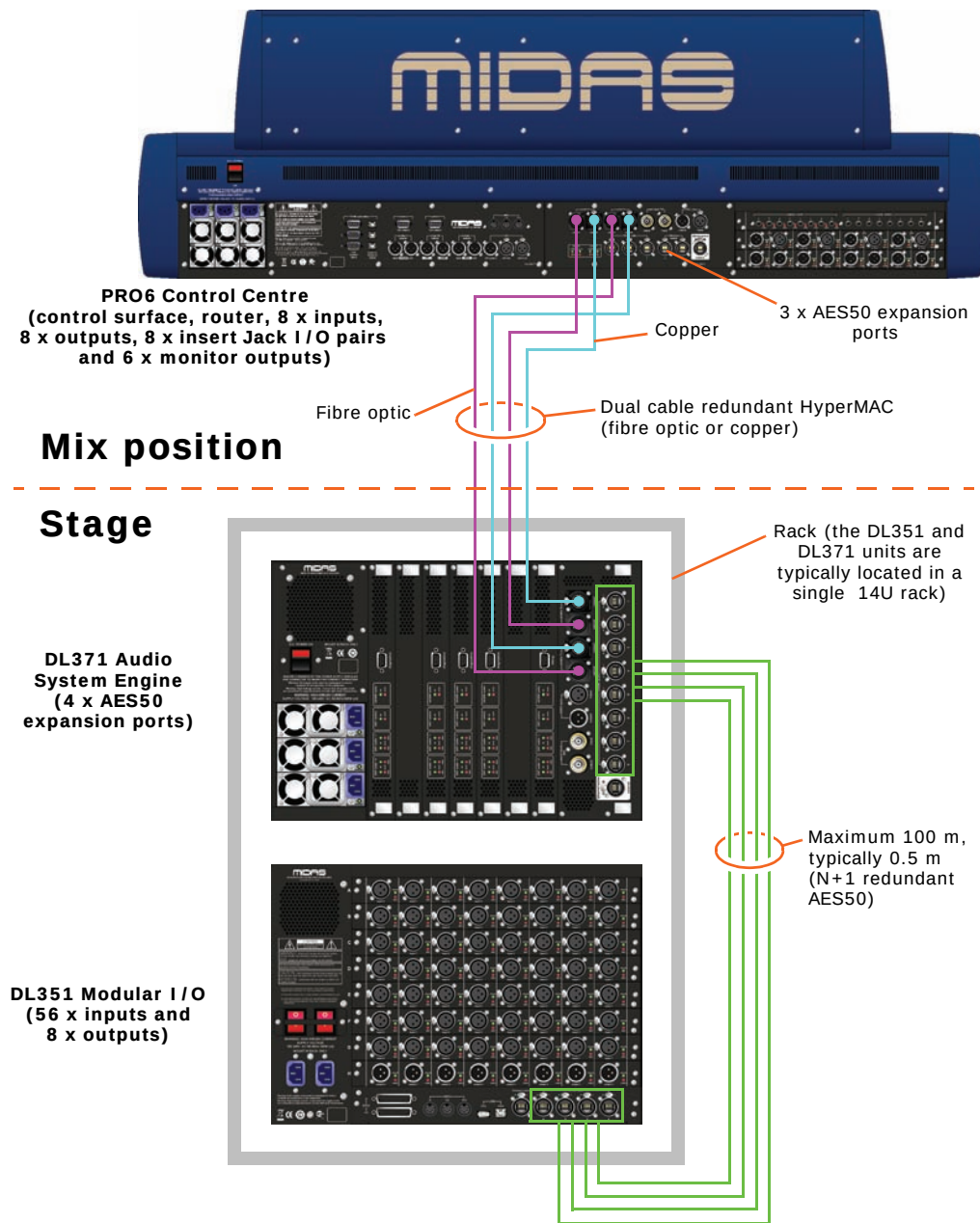


Figure 2: Standard system configuration

Important:

The PRO6 Control Centre, DL351 Modular I/O and DL371 Audio System Engine all have Volex locking type plugs fitted on their supplied mains cables, which plug into their mains IEC connectors. When fitted properly the Volex plug locks into place, preventing it working loose, or being inadvertently knocked loose or pulled out. For details of how to fit/remove a Volex plug, see “Power” on page xi.

Powering the PRO6 system

The following details the recommended power up and power down procedures for the PRO6 system.

Note: If you are in any doubt as to how to switch the DL3n1 units on/off, refer to their operator manuals.

>> To power up the PRO6 system

Important Note:

DO NOT switch on the speaker sub-system until after the start-up of the PRO6 system has been completed.

After all PRO6 system interconnections have been made (refer to Figure 2 “Standard system configuration” on page 50), start up the PRO6 system:

- 1** Make sure that all of the PRO6 system equipment is switched off, such as the PRO6 Control Centre, speaker sub-system, DL351 Modular I/O unit and DL371 Audio System Engine unit.
- 2** Switch on the PRO6 Control Centre (see “To switch on the PRO6 Control Centre” on page 52).
- 3** In the master bay of the PRO6 Control Centre, move all of the monitor and master channel faders to the minimum position and mute all of the master channels.
- 4** Power up the PRO6 components, such as the DL351 Modular I/O unit and the DL371 Audio System Engine unit. This can be done in any order you like.
- 5** After the **status** indicator at the top of each GUI screen has changed to green (as shown right), switch on the speaker sub-system.
- 6** Switch on the audio source and start playing the audio.
- 7** On the PRO6 Control Centre, check that the audio inputs are routed to the master channels. Then, unmute the master channels and gradually increase their faders while listening to the sound levels from the speakers.



If there is no sound at all coming from the speakers when the faders are at maximum, move the faders to below the 0dB level and check if the audio is muted somewhere along the input paths and also check that the individual speakers are switched on. If there is still no sound from the speakers, see “No audio” on page 73.

>> To power down the PRO6 system

Important Note:

BEFORE switching off any of the PRO6 system components, don't forget to mute the audio from the speakers and switch off the speaker sub-system.

- 1** Mute the audio from the speakers and switch off the speaker sub-system.
- 2** Switch off the DL351 Modular I/O unit.
- 3** Switch off the DL371 Audio System Engine unit.
- 4** Switch off the PRO6 Control Centre (see “To switch off the PRO6 Control Centre” on page 52).

Switching the PRO6 Control Centre on / off

Carry out the following to switch the PRO6 Control Centre on or off in a safe manner, observing all **WARNINGS** and **Cautions**.

>> To switch on the PRO6 Control Centre



Caution (1)!

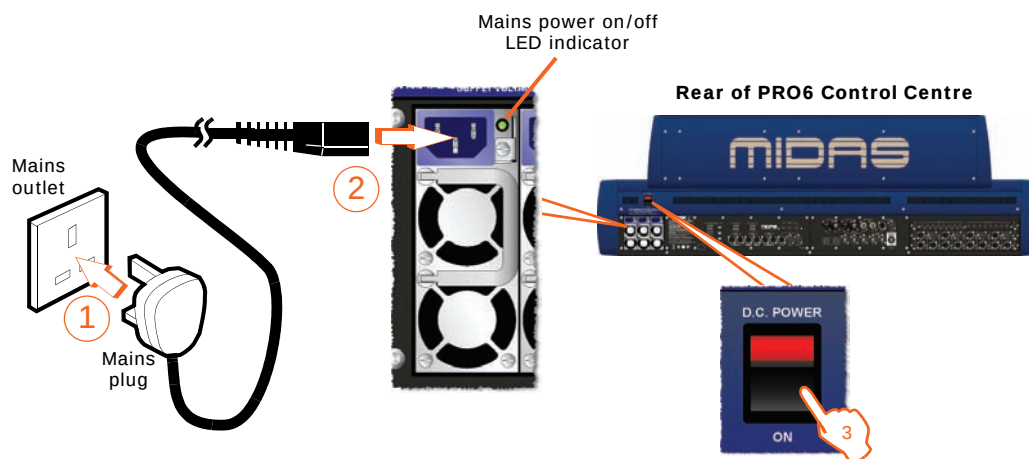
A minimum of two power supply modules must be supplying power to the PRO6 Control Centre for correct operation.



Caution (2)!

Before switching on, check that all monitor loudspeaker power amplifiers are turned off or muted.

After connecting up the audio cables, carry out the following:



- 1 Plug the three mains cables into the mains power outlets.
- 2 Observing **Caution (1)!** above, plug the Volex connectors (see "Wiring instructions" on page 10) of the mains cables into the mains sockets on the rear of the control centre. (The green LED next to each mains socket will illuminate if its mains supply is on.)
- 3 Observing **Caution (2)!** above, apply power to the PRO6 Control Centre by switching the **D.C. POWER** switch on. The PRO6 Control Centre will boot up and, when the default GUI screens are displayed, it is ready for use.

>> To switch off the PRO6 Control Centre

- 1 Make sure you have saved any shows, scenes or settings you require.
- 2 At the GUI, choose **home ▶ Preferences ▶ Shutdown System**.
- 3 At the **Shutdown ENTIRE system?** prompt, click **OK**.
- 4 After the shutdown sequence has finished, switch off the **D.C. POWER** switch (rear of control centre).
- 5 Disconnect the mains cables from the rear of the PRO6.

Setting up the DL351 Modular I/O unit ID

After connecting up your PRO6 network system, you may need to set up the ID of the DL351 Modular I/O unit, which is done via its control panel (see Figure 3 below). You only need to do this if the unit is not already configured to the ID you want; there are four ID numbers available (1 to 4) and the default is ID 1. The unit's ID number is shown at the end of the bottom line in the default display, for example, the ID of the unit shown in Figure 3 is "1".

To change the ID number there is no need to switch on the PRO6 Control Centre, as the procedure can be carried out offline.

Refer to the operator manual for the DL351 Modular I/O if you require more details.

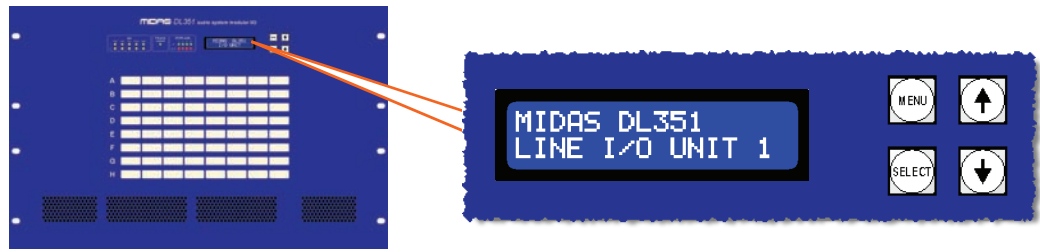


Figure 3: Control panel of the DL351 Modular I/O (showing default display)

>> To set up the ID of the DL351 Modular I/O unit

- 1 Make sure the DL351 Modular I/O unit is switched on.
- 2 Press **MENU** and hold for approximately two seconds to enter the main menu. You have entered the main menu when the first option is displayed.
- 3 Press the down arrow button  to go to the set ID option.
- 4 Press **SELECT** to go to the "Select ID" screen.
- 5 Press the down arrow button  to go to the ID 2 option.
- 6 Press **SELECT** to choose the ID 2 option.
- 7 Press **MENU** to exit menu mode.

Main menu
1 AES clock

Main menu
2 Set ID

Select ID
1

Select ID
2

Trying ID
2

Saving new ID
2

Main menu
2 Set ID

MIDAS DL351
LINE I/O UNIT 2

Thank you for reading through this Operator Manual.
We hope you found it useful.

Please feel free to send us your comments.
Our contact details and website address can be found
at the front of this manual.



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